

**Record of Decision Amendment
for the
Technical Support Facility Injection Well (TSF-05)
and Surrounding Groundwater Contamination
(TSF-23) and Miscellaneous No Action Sites,
Final Remedial Action**

August 2001

**Operable Unit 1-07B
Waste Area Group 1
Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho**

PART I - DECLARATION

SITE NAME AND LOCATION

Technical Support Facility Injection Well (TSF-05) and
Surrounding Groundwater Contamination (TSF-23),
Operable Unit 1-07B
Idaho National Engineering and Environmental
Laboratory (CERCLIS ID 4890008952)
Idaho Falls, Idaho

Test Area North (TAN) is one of nine major facilities at the Idaho National Engineering and Environmental Laboratory (INEEL), a U.S. Department of Energy (DOE) facility located in southeastern Idaho, 51.5 km (32 mi) west of Idaho Falls. The INEEL encompasses approximately 2,305 km² (890 mi²) of the northeastern portion of the Eastern Snake River Plain and extends across portions of five counties: Butte, Jefferson, Bonneville, Clark, and Bingham. The TAN complex, near the northern end of the INEEL, extends over an approximately 30-km² (12-mi²) area. The Technical Support Facility (TSF), which is centrally located within TAN, covers an approximately 460 by 670 m (1,500 by 2,200 ft) area and is surrounded by a security fence. The TSF-05 Injection Well is located in the southwest corner of TSF.

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) Amendment presents a modification to the original remedy for Operable Unit (OU) 1-07B, at the INEEL TAN. The modification was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The documents that form the basis for the decisions made in this ROD Amendment are contained in the Administrative Record for OU 1-07B. This decision satisfies the requirements of the Federal Facility Agreement and Consent Order (FFA/CO) entered into among the DOE, the U.S. Environmental Protection Agency (EPA), and the State of Idaho.

The primary risk driver for OU 1-07B has been determined to be the ingestion of groundwater contaminated with the volatile organic compound (VOC) trichloroethene (TCE). The other VOC contaminants of concern (COCs) – tetrachloroethene (PCE) and cis-1,2- and trans-1,2-dichloroethenes (DCE) – are less widespread in the contaminant plume than TCE. Also present are four radionuclides – Cs-137, Sr-90, tritium, and U-234 – that have been included as COCs because they exceed EPA risk-based concentrations for groundwater ingestion. TCE and PCE are the only two COCs consistently detected in the production wells at levels exceeding federal drinking water standards (maximum contaminant limits [MCLs]).

The original selected remedial action for OU 1-07B documented in the *Record of Decision for Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites Final Remedial Action* (DOE-ID 1995 [DOE/ID-10139]) (the 1995 ROD) was identified as “Alternative 4: 25 Micrograms per Liter Trichloroethene Groundwater

Contamination Plume Extraction; Hot Spot Containment and/or Removal with Aboveground Treatment.” However, the 1995 ROD provided a way to amend the selected remedy by calling for treatability studies:

“If a technology is found to be more effective than [the selected remedy], the Agencies shall, after appropriate public opportunity to review the basis for changing the selected technology, modify this ROD as appropriate and begin design implementation on the alternate remedy.”

Treatability studies conducted between 1995 and 1999 showed that use of monitored natural attenuation (MNA) and an innovative technology, in situ bioremediation (ISB), in combination with the originally selected pump-and-treat technology, could clean up the contaminant plume in less time and at a lower cost than the remedy originally selected in the 1995 ROD. Therefore, in accordance with Section 117(c) of CERCLA and Section 300.435(c)(2)(ii) of the NCP, and pursuant to the 1995 ROD, this ROD Amendment has been prepared to document the changes.

The amended remedy identified in this ROD Amendment is intended to be the final action for remediation of contamination at OU 1-07B. All public participation and documentation procedures specified in NCP Sections 300.435(c)(2)(ii) and 300.825(a)(2) were conducted as required, including issuing a proposed plan (the *Proposed Plan for Operable Unit 1-07B, Final Remedial Action at the TSF Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23)* [DOE-ID, EPA, and IDEQ 2000]) that highlighted the proposed changes.

The DOE Idaho Operations Office (DOE-ID) is the lead agency for the remedy decisions under Executive Order 12580. EPA approves the decisions and, along with the Idaho Department of Environmental Quality (IDEQ), has participated in the selection of the remedy. The IDEQ concurs with the amended remedy for the OU 1-07B final remedial action. The DOE, EPA, and IDEQ are collectively referred to as the Agencies in this document. Within the INEEL’s environmental restoration program, this action is OU 1-07B. OU 1-07B is one of several CERCLA sites within Waste Area Group (WAG) 1. Institutional controls, which are applied to sites where residual contamination precludes unrestricted land use, are being implemented for all sites within WAG 1 in accordance with Section 12.1 of the *Final Record of Decision for Test Area North, Operable Unit 1-10* (DOE-ID 1999a [DOE-ID-10682]) (OU 1-10 ROD).

ASSESSMENT OF THE SITE

The response action selected in this ROD Amendment is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this site that may present an imminent and substantial endangerment to public health or welfare.

DESCRIPTION OF THE AMENDED REMEDY

The OU 1-07B amended remedy will prevent current and future exposure of workers, the public, and the environment to contaminated groundwater at the TSF injection well site. This remedial action will permanently reduce the toxicity, mobility, and volume of the contamination at the site. It will meet the final remedial action objectives (RAOs) to ensure the contaminant plume meets drinking water standards by or before 2095. This will be the final action for this site. None of the source materials constitutes a principal threat as defined by the EPA.

The amended remedy modifies the actions that will be taken in two of the three zones of the contaminant plume:

- At the hot spot, ISB will be used in place of the pump-and-treat remedy selected in the 1995 ROD. In ISB, amendments such as sodium lactate are added to the aquifer to enhance biological activity. ISB results in complete dechlorination of VOCs in situ. The ISB treatment system will be able to continuously distribute the amendments. The ISB treatment was selected to replace the Groundwater Treatment Facility (GWTF) remedy implemented under the 1995 ROD. GWTF operations will end when the amended remedy is implemented.
- In the distal zone, MNA will be used in place of the pump-and-treat remedy selected in the 1995 ROD. Natural attenuation acts without human intervention to reduce the toxicity, mobility, and volume of contaminants in the groundwater. Contaminant levels will be monitored to ensure an appropriate decay rate is being achieved. If, during periodic reviews conducted at least every 5 years, MNA is determined to be inadequate for restoration of the distal zone by 2095, then a contingency remedy for the distal zone will be implemented. The contingency remedy also will be invoked if the required monitoring necessary for MNA is not performed. The contingency remedy for the distal zone is the default remedy selected in the 1995 ROD: groundwater extraction, aboveground treatment of VOCs, and reinjection of the treated water or, if the Agencies concur, implementation of a more cost-effective remedy identified at the time the contingency remedy is implemented.

The components of the original remedy selected in the 1995 ROD, and refined in a 1997 Explanation of Significant Differences (ESD) (INEEL 1997 [INEEL/EXT-97-00931]), that will continue to be implemented are as follows:

- In the medial zone, a pump-and-treat system will be used. Construction of the New Pump and Treat Facility (NPTF) in the medial zone was completed in January 2001. The facility is scheduled to start routine operations in Fall 2001 and is planned to operate until VOCs in the medial zone meet RAOs. Extraction wells will capture contaminated groundwater for onsite treatment by air stripping, followed by reinjection of the treated water into the aquifer.
- Throughout the contaminant plume, institutional controls, including restrictions on the installation of new drinking water wells, will remain in effect until the groundwater meets RAOs and unrestricted land-use is allowable. The institutional controls are being implemented in accordance with the OU 1-10 ROD for protection of human health.

Throughout the plume, final RAOs will be met by or before 2095, ensuring the contaminant plume meets drinking water standards.

This ROD Amendment also describes the contingency remedy for the medial zone in the event that radionuclide COCs migrate downgradient to medial zone extraction wells during the remedial action:

- In the event that the radionuclide COCs (Cs-137, Sr-90, tritium, and U-234) in the medial zone portion of the plume exceed established limits, that portion of the plume would be intercepted upgradient of the NPTF. After treatment to remove VOCs (as was done during the ISB treatability studies conducted to support this ROD Amendment), the treated water would be reinjected upgradient from the extraction well to facilitate sorption of radionuclides onto subsurface soil and rock.

STATUTORY DETERMINATION

The amended remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial actions, is cost effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

This amended remedy also satisfies the statutory preference for treatment as a principal element of the amended remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Because this amended remedy will result in COCs remaining on-site during the remedial action above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years after initiation of remedial action, and at least every 5 years thereafter through the standard CERCLA 5-year review process. The reviews will be conducted to ensure that the amended remedy is, or will be, protective of human health and the environment. This provision does not preclude more frequent reviews by one or more of the Agencies.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section (Part II) of this ROD Amendment. Additional information can be found in the Administrative Record for this OU.

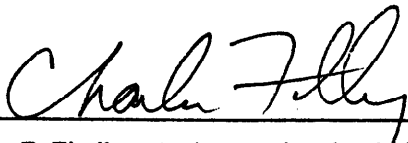
- COCs and their respective concentrations (Part II, Table 2-1)
- Estimated costs (in net present value [NPV] using a 7% discount rate) (Part II, Section 8)
- Key factor(s) that led to selecting the amended remedy (i.e., how the amended remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision (Part II, Section 7).

The following information is not included in this ROD Amendment because it is unchanged from the original 1995 ROD for this OU:

- Baseline risk represented by the COCs
- Cleanup levels established for the COCs and the basis for these levels
- How source materials constituting principal threats are addressed
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and 1995 ROD.

SIGNATURE SHEET

Signature sheet for the Record of Decision Amendment for OU 1-07B, located in Waste Area Group 1, Test Area North, of the Idaho National Engineering and Environmental Laboratory, between the U.S. Environmental Protection Agency Region 10 and the U.S. Department of Energy Idaho Operations Office, with concurrence by the Idaho Department of Environmental Quality.



Charles E. Findley, Acting Regional Administrator
Region 10
U.S. Environmental Protection Agency

09/19/01

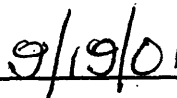
Date

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C. Stephen Alfred, Administrator
Idaho Department of Environmental Quality



Date

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Beverly A Cook

Beverly A. Cook, Manager
U.S. Department of Energy,
Idaho Operations Office

9/20/01

Date

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ACRONYMS

AOC	area of contamination
APC	air pollution control
ARAR	applicable or relevant and appropriate requirement
ASTU	Air Stripper Treatment Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
D&D	decontamination and decommissioning
DCE	cis- and trans-1,2-dichloroethene
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy, Idaho Operations Office
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FDR	Field Demonstration Report
FFA/CO	Federal Facility Agreement and Consent Order
FS	feasibility study
FY	fiscal year
GWTF	Groundwater Treatment Facility
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
ISB	in situ bioremediation
ISCO	in situ chemical oxidation
MCL	maximum contaminant level
MERD	metal enhanced reductive dehalogenation

MNA	monitored natural attenuation
O&M	operations and maintenance
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NPTF	New Pump and Treat Facility
NPV	net present value
OSWER	(EPA) Office of Solid Waste Environmental Remediation
OU	operable unit
PCE	tetrachloroethene
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SOW	scope of work
TAN	Test Area North
TCE	trichloroethene
TEWP	Technology Evaluation Work Plan
TSF	Technical Support Facility
UIC	underground injection control
VOC	volatile organic compound
WAG	waste area group

NOMENCLATURE

μg	microgram
Cs	cesium
ft	feet
g	gram
gal	gallon
gpm	gallons per minute
H	hydrogen
in.	inch
kg	kilogram
km	kilometer
L	liter
m	meter
mg	milligram
mrem	millirem
mi	mile
pCi/L	picocuries per liter
ppb	parts per billion
ppmw	parts per million weight
Sr	strontium
U	uranium
yr	year